Minutes of spin meeting 09/26/07

Fanglei first presented her spin tracking analysis on the vertical tune scan polarization data taken in run6 with 14% cold snake and 5.9% warm snake. 100 particles with vertical Gaussian distribution were used for the tracking. For the case of $36+\nu$, the partial snake resonance locations are qualitatively close to the measured one. For the case of $12+\nu$, the simulation shows that the polarization should be flat after $\nu_y > 8.93$, while experimental polariazation gradually goes up with vertical tune, which may indicate some other polarization loss mechanism here. There is no orbit errors included in the tracking. Leif suggested to do tracking for even lower tune (polarization should be in a stable region, as vertical tune is far outside the spin tune gap). Haixin suggested to try different random generator seeds to look for the variation of simulated final polarizations.

Leif reported that Vincent is working on reproducing the measured betatron tunes for snake on/off lattices. The first attempt with the archived AGS machine configuration did not converge. Vincent continues with turning off some power supplies.

The discussion continues on what we should do for next run: such as strength of the cold snake, injection/extraction energy, injection scheme, etc. Kevin suggested that we design some experiments to explore the unknown relative 10% polarization loss. In fact, we have started this run to explore the possible polarization loss near AGS injection. More thoughts should be given to all possible schemes and how to confirm them. Woody asked if we can be sure that AGS injection polarization matches 200MeV polarization measurement.The E880 polarimeter analyzing power near AGS injection ($G\gamma = 7.5$) is only known to $\Delta P/P$=6%. So even though we could check the relative level of polarization from yesar to year, it is not easy to ruled out Booster polarization loss. For example, we have checked the harmonics 3 and 4 in the Booster every year, but we never explored harmonic 2 in the Booster since $G\gamma = 2$ is lower than the injection $G\gamma = 2.17$. In general, the resonance $G\gamma = 2$ is even weaker than resonances at $G\gamma = 3$ and 4 and the separation of 0.17 is enough. Given the difficulty of turning on strong partial snake at $G\gamma = 4.5$, Kevin asked if it is possible to raise the injection by one unit of $G\gamma$. This would requires to push Booster vertical tune higher than 5.5, or a way of overcoming $0 + \nu$ in the Booster (such as an AC dipole). Kevin will look how high the Booster vertical tune can be set. It could be a value allows higher AGS injection but not a full unit of $G\gamma$. In the presence of strong partial snakes in the AGS, the injection $G\gamma$ value other than half integer is questionable due to spin mismatch but should also be checked. Haixin asked Ernest to consider MAD calculation of higher vertical tune path near injection (better to be in the spin tune gap), which maybe applicable with on-the-fly injection.

The strategy of next run is a very big topic and we will continue to discuss it in next meeting.

Haixin